REMARKS / ARGUMENTS

Please note that the claim amendments provided above consist solely of correcting a typographical error noted by the Examiner, and further correcting additional typographical errors noted by the Applicants. Consequently, no new matter has been added, and no new search is required.

This application is believed to be in condition for allowance because the claims, as amended, are non-obvious and patentable over the cited references. The following paragraphs provide the justification for this belief. In view of the following arguments, the Applicants hereby respectfully request further examination and reconsideration of the subject patent application.

1.0   Claim Objections:

In the Office Action of March 21, 2005, claim 1 was objected to as including an apparent typographical error. In particular, the claim as originally written inadvertently included the phrase "representative *cluster* at a cluster center." As noted by the Examiner, the phrase should read "representative *exemplar* at a cluster center." An appropriate amendment has been made. Note that Applicants have also corrected an additional typographical error in claim 1 in the element: "generating an observation likelihood function for each exemplar cluster based on a computed distance *between exemplars each cluster*" as follows: "generating an observation likelihood function for each exemplar cluster based on a computed distance *between the exemplars in each cluster.*" It is believed that the aforementioned amendments fully address the Examiner's concerns regarding the objection to the informalities in claim 1. Consequently, it is respectfully requested that the objection to informality of claim 1 be withdrawn in light of the aforementioned amendments.

In addition, the Office Action also objected to the preamble of claim 32, as reciting "A computer readable medium having computer executable instructions for automatically tracking patterns in a set of tracking data, said computer executable instructions comprising..." In particular, the Office Action suggested that the preamble was in error "because a computer does not execute instructions." The Office action then suggested alternate language for the preamble.

In response to this objection, the Applicants respectfully suggest that computers do in fact execute instructions contained within computer readable media (software). In fact, Applicants believe this to be one of the basic principles upon which computer software causes a computer to perform particular tasks. Further, Applicants would like to point out that the USPTO routinely issues patents having claims directed towards computer executable instructions. For example the following issued U.S. patents, selected completely at random, each contain one or more claims directed towards "computer executable instructions:"

1. 5,819,032
2. 6,101,499
3. 6,892,390
4. 6,427,171
5. 6,671,110
6. 6,826,755
7. 6,658,423
8. 6,829,779
9. 6,415,318
10. 6,831,663

Consequently, in view of Applicants understanding of the general operation of computer executable instructions (software), and in view of the USPTO's routine issuance of patents containing claims directed towards "computer executable instructions," Applicants respectfully traverse the objection to claim 32, and respectfully request that the objection to the suggested error in the preamble of claim 32 be withdrawn in light of the preceding discussion.

2.0   Rejections Under 35 U.S.C. §103(a):

In the Office Action of March 21, 2005, claims 1, 2, 8, 11 and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Menon, et al. (U.S. Patent No. 5,703,964, hereinafter "*Menon*") in view of Aggarwal, et al. (U.S. Patent No. 6,307,965, hereinafter "*Aggarwal*").

In addition, claims 3, 14, 15, 16, 22, 32, 33, 34, 36 and 37 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon* and *Aggarwal* in further view of Mojsilovic et al. (U.S. Patent Application Publication No. 2003/0123737, hereinafter "*Mojsilovic*").

Claims 4, 5 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon* and *Aggarwal*, as applied to claim 1, and further in view of Hu et al. (U.S. Patent No. 5,867,584, hereinafter "*Hu*").

Claims 6, 7 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon* and *Aggarwal*, and further in view of Perona et al. (U.S. Patent Application Publication No. 2003/0026483, hereinafter "*Perona*").

Claims 17 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal* and *Mojsilovic*, and further in view of *Hu*.

Claims 19 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal* and *Mojsilovic*, and further in view of *Perona*.

Claims 21, 23, 24, 25, 28 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal* and *Mojsilovic*, and further in view of the paper entitled "Real-Time Object Detection for 'Smart' Vehicles" by Gavrila and Philomin,

Proc. of IEEE International Conference On Computer Vision, pp. 87-93, Kerkyra, 1999, hereinafter "*Gravila*".

Claims 26 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal*, *Mojsilovic* and *Gravila*, and further in view of Etoh (U.S. Patent No. 5,519,789, hereinafter "*Etoh*").

Claim 29 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal*, *Mojsilovic* and *Gravila*, and further in view of *Hu*.

Claim 30 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal*, *Mojsilovic* and *Gravila*, and further in view of *Perona*.

Claim 35 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal*, *Mojsilovic* and *Etoh*, and further in view of the book entitled "Probability and Statistics for Engineers and Scientists," 2nd Edition, by Walpole and Myers, hereinafter "*Walpole*".

Claim 13 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon* and *Aggarwal*, as applied to claim 1, and further in view of Honey et al. (U.S. Patent No. 5,389,790, hereinafter "*Honey*").

Finally, claim 38 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal*, and *Mojsilovic* and further in view of *Honey*.

In order to deem the Applicant's claimed invention unpatentable under 35 U.S.C. §103(a), a prima facie showing of obviousness must be made. However, as fully explained by the M.P.E.P. Section 706.02(j), to establish a prima facie case of obviousness, three basic criteria must be met. First, *there must be some suggestion or motivation*, either in the references themselves or in the knowledge generally

available to one of ordinary skill in the art, *to modify the reference* or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, *the prior art reference (or references when combined) must teach or suggest all the claim limitations.*

Further, in order to make a prima facie showing of obviousness under 35 U.S.C. 103(a), all of the claimed elements of an Applicant's invention must be considered, especially when they are missing from the prior art. If a claimed element is not taught in the prior art and has advantages not appreciated by the prior art, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

2.1 Rejection of Claims 1, 2, 8, 11 and 12:

As noted above, the Office Action rejected claims 1, 2, 8, 11 and 12 under 35 U.S.C. §103(a) as being unpatentable over *Menon* in view of *Aggarwal*.

In particular, with respect to claim 1, the Office Action first suggests "Menon teaches... automatically learning a set of exemplars from at least one set of training data." The Office Action offers col. 6, lines 35-48 of the *Menon* reference in support of the argument by explaining that "Menon teaches receiving training data patterns in the form of feature pattern vectors."

However, Applicants respectfully suggest that the Office Action has incorrectly characterized the Menon reference with respect to this first point. In particular, it should be noted that Applicants are specifically claiming "automatically *learning a set of exemplars* from at least one set of training data" (emphasis added). In other words, given a set of data, such as, for example, an image or an audio signal, the claimed

invention will automatically *learn* exemplars from that set of training data. No exemplars are provided to the claimed system from some external source, as these learned exemplars are instead learned from the training data. In view of the detailed description of the present patent application, it should be clear that the plain meaning of this "learning" is that a probabilistic analysis of the training data is used to find exemplars within the training data. (See, for example, page 24, line 17 through page 26 line 10 of the pending patent application, as filed).

The Office Action appears to be equating the applicants "learned exemplars" with the "training data patterns" that are provided to the system described by *Menon* "in the form of feature pattern vectors." However, it should be clear that the "feature pattern vectors" described by *Menon* are manually identified and manually provided to the system to "form different categories" (see col. 1, lines 50-67, for example). In particular, *Menon* explains that the "training data patterns" or "feature pattern vectors" used in the described pattern recognition system are manually identified and provided to the system, which then clusters those "feature pattern vectors" based on a computed correlation distance between each "feature pattern vector" and each "category."

Clearly, *Menon* is clustering "feature pattern vectors" to form categories rather than *learning* exemplars from training data. In other words, *Menon* clusters similar "feature pattern vectors" which are manually identified as training data. In contrast, Applicants *extract* exemplars from the training data in a probabilistic *learning* process. Consequently, Applicants respectfully that the text of the *Menon* reference cited by the Office Action fails to teach the claimed element for which is it is offered (*"learning a set of exemplars* from at least one set of training data").

Next, the Office Action suggests that *Menon* teaches "generating an observation likelihood function for each exemplar cluster based on a computed distance between exemplars each cluster." In particular, the Office Action explains that "Menon teaches creating training class histograms which are used in determining the classification of the

14

subject." The Office Action offers col. 3, lines 1-11 and 41-48 of the *Menon* reference in support of this contention. The Office Action then continues in discussing the claimed element by suggesting that in "col. 1, lines 38-43, Menon teaches a correlation or distance between exemplars is computed between the training pattern and the category and added to a cluster of the category."

However, the Applicants respectfully suggest that the Office Action has incorrectly characterized the Menon reference with respect to the claimed element of "generating an observation likelihood function for each exemplar cluster based on a computed distance between exemplars each cluster." In particular, it should be clear that the claimed element operates to generate an *observation likelihood function* for each individual *cluster* based on *computed distances between the exemplars* in each individual cluster.

In contrast, the text of the *Menon* reference, as cited by the Office Action appears to explain that particular "training patterns" are added to clusters (or "categories") *based on a computed distance* between each "training pattern" and the set of "categories" (see col. 1, lines 31-49). As explained in col 3. lines 1-11, "observation class histograms" are then formed by accumulating "training class histograms" associated with each "test data frame." Note that Menon explains in col. 2, lines 51-67 that *after* "training and labeling categories" (i.e., clustering the training patterns), the system uses "test data" from a test subject in forming "observations." Clearly, *Menon* is *not* generating observation likelihood functions for individual clusters based on computed distances between exemplars in each cluster, as described and claimed by the Applicants. In fact, Applicants respectfully suggest that the Office Action has improperly combined several features of the *Menon* system in a way which does not appear to be consistent with the teachings of the *Menon* reference in an attempt to show a teaching of the Applicants claimed feature relating to "observation likelihood functions."

Consequently, Applicants respectfully that the text of the *Menon* reference cited by the Office Action fails to teach the claimed element for which is it is offered ("generating an observation likelihood function for each exemplar cluster based on a computed distance between exemplars each cluster").

The Office Action the offers the *Aggarwal* reference as teaching the use of the "k-medoid method to form clusters of information in which the medoids are used as anchor data values (representative exemplar at center) about which the clusters are detected. However, the use of the "k-medoid method to form clusters of information" clearly fails to teach those elements of the claimed invention discussed above with respect to the *Menon* reference.

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 1, as cited below. Therefore, the Applicants respectfully traverse the rejection of claims 1, 2, 8, 11 and 12 and request reconsideration of the rejection of claims 1, 2, 8, 11 and 12 under 35 U.S.C. §103(a) over *Menon* in view of *Aggarwal* in view of the non-obviousness of claim 1, which includes the following novel language:

> "A system for automatic probabilistic pattern tracking comprising:
> *automatically learning a set of exemplars* from at least one set of training data;
> clustering the exemplars into more than one cluster of exemplars, with each cluster having a representative exemplar at a cluster center;
> *generating an observation likelihood function for each exemplar cluster based on a computed distance between the exemplars* in each cluster;

> providing the exemplar clusters, observation likelihood functions, and target data to a probabilistic tracking function; and
>
> probabilistically tracking at least one pattern in the target data by using the exemplar clusters, observation likelihood functions, and target data to predict at least one target state." (emphasis added)

2.2   <u>Rejection of Claim 3:</u>

The Office Action rejected claim 3 under 35 U.S.C. §103(a) as being unpatentable over *Menon* and *Aggarwal* in further view of *Mojsilovic*.

However, as described above, independent claim 1, which is the parent claim of claim 3, is patentable over the *Menon* and *Aggarwal* combination under 35 U.S.C. §103(a), as that combination fails to teach or describe at least one of the elements of the Applicants claimed invention. In view of the discussion provided above in Section 2.1, it is clear that further modifying the *Menon* and *Aggarwal* combination reference to provide an alleged capability to use a multidimensional scaling process to estimate a dimensionality of each exemplar cluster, still fails to teach the underlying automatic probabilistic pattern tracking claimed by the Applicants. Consequently, modifying the *Menon* and *Aggarwal* combination reference in an attempt to address a particular feature of a dependent claim cannot serve to disclose the Applicants claimed invention where the *Menon* and *Aggarwal* combination reference relied on by the Office Action fails to disclose the parent claim.

However, regardless of the patentability of the parent claim, the Applicants respectfully suggest that the Office Action has incorrectly characterized the *Mojsilovic* reference with respect its alleged capability to estimate a dimensionality of each exemplar cluster using a multidimensional scaling (MDS) process.

In particular, in paragraphs 47-51 of the *Mojsilovic* reference, *Mojsilovic* explains that a dimensionality analysis (i.e., an MDS process) is used to generate a *similarity matrix* which evaluated for use in *clustering* "features." In other words, *Mojsilovic* 1) computes distances between features using MDS; *then* 2) constructs a similarity matrix; and *then* 3) generates clusters based on an evaluation of the similarity matrix.

In stark contrast, the Applicants describe and claim a system wherein an MDS analysis is used to estimate a dimensionality of each exemplar cluster, *after* that cluster has been formed. Clearly, this is not what is being described by the *Mojsilovic* reference.

Consequently, with respect to claim 3, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claim is patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 1, as cited above, and of dependent claim 3 which includes the following novel language:

> "The system of claim 1 wherein generating the observation likelihood functions comprises using a multidimensional scaling process to *estimate a dimensionality of each exemplar cluster.*" (emphasis added)

Therefore, the Applicants respectfully traverse the rejection of claim 3 and request reconsideration of the rejection of claim 3 under 35 U.S.C. §103(a) over *Menon* and *Aggarwal* in further view of *Mojsilovic* in view of the non-obviousness of claims 1 and 3.

2.3   Rejection of Claims 14, 15, 16, 22:

The Office Action rejected claims 14, 15, 16, and 22 under 35 U.S.C. §103(a) as being unpatentable over **Menon** and **Aggarwal** in further view of **Mojsilovic**.

In particular, the Office Action first suggests that with respect to independent claim 14, the **Menon** reference teaches "deriving exemplars from at least one set of training data…" However, as discussed above with respect to claim 1, the **Menon** reference does **not** in fact derive or learn exemplars, and the "feature pattern vectors" used by the **Menon** reference are manually selected and supplied to the **Menon** system, and are **not** extracted, learned, or in any way **derived** from the "training data."

Further, with respect to estimating the dimensionality of each cluster, as discussed above with respect to the rejection of claim 3, the **Mojsilovic** reference fails to teach the elements for which it is offered in that it does **not** "estimate a dimensionality for each of the exemplar clusters based on the computed minimum distances between exemplars in each exemplar cluster." Further, because **Mojsilovic** fails to estimate the dimensionality of exemplar clusters, as disclosed and claimed by the Applicants, any alleged teaching by **Aggarwal** to compute a minimum distance between exemplars in each exemplar cluster has no bearing on the alleged teaching of estimating the dimensionality of exemplar clusters by the **Mojsilovic** reference.

Finally, because **Mojsilovic** fails to estimate the dimensionality of exemplar clusters, the proposed **Menon, Aggarwal, Mojsilovic** combination also fails to disclose the applicants claimed element of **computing** "**an observation likelihood function for each exemplar cluster based on the <u>dimensionality</u> of each exemplar cluster.**"

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected

19

claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 14, as cited below. Therefore, the Applicants respectfully traverse the rejection of claims 14, 15, 16, and 22, and request reconsideration of the rejection of claims 14, 15, 16, and 22 under 35 U.S.C. §103(a) over *Menon* and *Aggarwal* in further view of *Mojsilovic* in view of the non-obviousness of claim 14, which includes the following novel language:

"A method for generating a set of observation likelihood functions from a set of exemplars comprising using a computer to:

derive more than one exemplars from at least one set of training data to create a set of exemplars;

randomy select more than one exemplar from the set of exemplars; iteratively cluster similar exemplars from the set of exemplars around the randomly selected exemplars to form an exemplar cluster for each of the randomly selected exemplars;

estimate a dimensionality for each of the exemplar clusters based on the computed minimum distances between exemplars in each exemplar cluster; and

compute an observation likelihood function for each exemplar cluster based on the dimensionality of each exemplar cluster."

(emphasis added)

2.4   Rejection of Claims 32, 33, 34, 36 and 37:

The Office Action rejected claims 32, 33, 34, 36 and 37 under 35 U.S.C. §103(a) as being unpatentable over *Menon* and *Aggarwal* in further view of *Mojsilovic*.

Independent claim 32 was rejected using the same arguments as discussed above with respect to the rejections of claims 1, 3 and 14. Consequently, because

claim 32 recites elements similar to those of claims 1, 3 and 14, it is also patentably distinct from the proposed **Menon**, **Aggarwal**, **Mojsilovic** combination.

For example, as described above, the proposed **Menon**, **Aggarwal**, **Mojsilovic** combination fails to teach "using the computed distance to estimate an observation likelihood function for each cluster of exemplars," as disclosed and claimed by the Applicants.

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 32, as cited below. Therefore, the Applicants respectfully traverse the rejection of claims 32, 33, 34, 36 and 37, and request reconsideration of the rejection of claims 32, 33, 34, 36 and 37 under 35 U.S.C. §103(a) over **Menon** and **Aggarwal** in further view of **Mojsilovic** in view of the non-obviousness of claim 32, which includes the following novel language:

> "A computer-readable medium having computer executable instructions for automatically tracking patterns in a set of tracking data, said computer executable instructions comprising:
>
> generating at least one set of clustered exemplars from a set of training data;
>
> for each exemplar cluster, computing a distance between a representative exemplar at a center of each cluster and each of the other exemplars in that cluster;
>
> ***using the computed distance to estimate an observation likelihood function for each cluster of exemplars***; and

using the observation likelihood function for each cluster of
exemplars to probabilistically track at least one pattern in at least one set
of tracking data." (emphasis added).

2.5   Rejection of Claims 4, 5 and 9, Claims 6, 7 and 10, and Claim 13:

The Office Action rejected claims 4, 5 and 9 under 35 U.S.C. §103(a) as being
unpatentable over *Menon* and *Aggarwal* in further view of *Hu*, based in part on the
rationale used for the rejection of claim 1, as discussed above in Section 2.1. Similarly,
claims 6, 7 and 10 were rejected over the proposed *Menon, Aggarwal, Perona*
combination. Similarly, claim 13 was rejected over the proposed *Menon, Aggarwal,*
Honey combination.

However, as discussed above with respect to the rejection of claim 1, the *Menon*
and *Aggarwal* combination fails to teach or describe at least one of the elements of the
Applicants claimed invention. Consequently, in view of the discussion provided above
in Section 2.1, it is clear that modifying the *Menon* and *Aggarwal* combination in an
attempt to address particular features of dependent claims 4, 5 and 9, claims 6, 7 and
10, and claim 13, cannot serve to disclose the Applicants claimed invention where the
Menon and *Aggarwal* combination reference relied on by the Office Action fails to
disclose the parent claim.

Consequently, no prima facie case of obviousness has been established in
accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In*
Re Fine. This lack of a prima facie showing of obviousness means that the rejected
claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the
nonobvious language of independent claim 1, as cited above. Therefore, the Applicants
respectfully traverse the rejection of claims 4, 5 and 9, claims 6, 7 and 10, and claim 13,
and request reconsideration of the rejection of claims 4, 5 and 9, claims 6, 7 and 10,
and claim 13 under 35 U.S.C. §103(a) over the *Menon, Aggarwal, Hu* combination, the

Menon, Aggarwal, Perona combination, and the *Menon, Aggarwal, Honey* combination, respectively, in view of the non-obviousness of claim 1, as cited above.

2.6   Rejection of Claims 17-18 and 19-20:

The Office Action rejected claims 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over *Menon, Aggarwal* and *Mojsilovic* in further view of *Hu*, based in part on the rationale used for the rejection of claim 14, as discussed above in Section 2.3. Similarly, claims 19 and 20 were rejected over *Menon, Aggarwal* and *Mojsilovic* in further view of *Perona*.

However, as discussed above with respect to the rejection of claim 14, the *Menon, Aggarwal, Mojsilovic* combination fails to teach or describe at least one of the elements of the Applicants claimed invention. Consequently, in view of the discussion provided above in Section 2.3, it is clear that modifying the *Menon, Aggarwal, Mojsilovic* combination in an attempt to address particular features of dependent claims 17-20 cannot serve to disclose the Applicants claimed invention where the *Menon, Aggarwal, Mojsilovic* combination reference relied on by the Office Action fails to disclose the parent claim.

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 14, as cited above. Therefore, the Applicants respectfully traverse the rejection of claims 17-20, and request reconsideration of the rejection of claims 17-18 and 19-20 under 35 U.S.C. §103(a) over the *Menon, Aggarwal, Mojsilovic, Hu* combination and the *Menon, Aggarwal, Mojsilovic, Perona* combination, respectively, in view of the non-obviousness of claim 14, as cited above.

2.7   Rejection of Claims 17-18, 19-20, and 21:

The Office Action rejected claims 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal* and *Mojsilovic* in further view of *Hu*, based in part on the rationale used for the rejection of claim 14, as discussed above in Section 2.3. Similarly, claims 19 and 20 were rejected over *Menon*, *Aggarwal* and *Mojsilovic* in further view of *Perona*. Similarly, Claim 21 was rejected under over *Menon*, *Aggarwal* and *Mojsilovic* in further view of *Gravila*.

However, as discussed above with respect to the rejection of claim 14, the *Menon*, *Aggarwal*, *Mojsilovic* combination fails to teach or describe at least one of the elements of the Applicants claimed invention. Consequently, in view of the discussion provided above in Section 2.3, it is clear that modifying the *Menon*, *Aggarwal*, *Mojsilovic* combination in an attempt to address particular features of dependent claims 17-21 cannot serve to disclose the Applicants claimed invention where the *Menon*, *Aggarwal*, *Mojsilovic* combination reference relied on by the Office Action fails to disclose the parent claim.

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 14, as cited above. Therefore, the Applicants respectfully traverse the rejection of claims 17-21, and request reconsideration of the rejection of claims 17-18, 19-20, and 21 under 35 U.S.C. §103(a) over the *Menon, Aggarwal, Mojsilovic, Hu* combination, the *Menon, Aggarwal, Mojsilovic, Perona* combination, and the *Menon, Aggarwal, Mojsilovic, Gravila* combination, respectively, in view of the non-obviousness of claim 14, as cited above.

24

2.8   Rejection of Claims 23, 24, 25, 28 and 31:

The Office Action rejected claims 23, 24, 25, 28 and 31 under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal* and *Mojsilovic* and further in view of *Gavrila*.

In particular, the Office Action first suggests that "arguments analogous to those presented in claims 1 and 14 above are applicable to claim 23..." The *Gavrila* refernce is then cited by the Office Action as teaching the Applicants claimed element of: "cluster the exemplars based on a minimization of a maximum distance between exemplars, and wherein each cluster includes a representative exemplar at the center of each cluster."

However, as described above with respect to the rejection of claims 1 and 14, the *Menon* reference fails to teach "*extract a set of exemplars from training data...*" because the "feature pattern vectors" used by the *Menon* reference are manually selected and supplied to the *Menon* system, and are *not* extracted, learned, or in any way *derived* from the "training data."

Further, with respect to estimating the dimensionality of each cluster, as discussed above with respect to the rejection of claim 3, the *Mojsilovic* reference fails to teach the elements for which it is offered in that it does *not* "estimate a dimensionality for each of the exemplar clusters." Finally, because *Mojsilovic* fails to estimate the dimensionality of exemplar clusters, the proposed *Menon*, *Aggarwal*, *Mojsilovic*, *Gavrila* combination also fails to disclose the applicants claimed element of *generate a likelihood function for each exemplar cluster using the estimated dimensionality*."

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected

claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 23, as cited below. Therefore, the Applicants respectfully traverse the rejection of claims 23, 24, 25, 28 and 31, and request reconsideration of the rejection of claims 23, 24, 25, 28 and 31 under 35 U.S.C. §103(a) over *Menon*, *Aggarwal*, and *Mojsilovic* in further view of *Gavrila*, in view of the non-obviousness of claim 23, which includes the following novel language:

> "A computer-implemented process for tracking patterns, comprising using a computer to:
>> ***extract a set of exemplars from training data;***
>> cluster the exemplars based on a minimization of a maximum distance between exemplars, and wherein each cluster includes a representative exemplar at the center of each cluster;
>> ***estimate a dimensionality for each exemplar cluster;***
>> ***generate a likelihood function for each exemplar cluster using the estimated dimensionality;***
>> provide the likelihood function, exemplar clusters, and target data to a tracking function; and
>> track at least one pattern in the target data using the tracking function in combination with the likelihood function and exemplar clusters."
> (emphasis added)

2.9 Rejection of Claims 26-27, 29, and 30:

The Office Action rejected claims 26-27 under 35 U.S.C. §103(a) as being unpatentable over *Menon*, *Aggarwal*, *Mojsilovic* and *Gravila* in further view of *Etoh*, based in part on the rationale used for the rejection of claim 23, as discussed above in Section 2.8. Similarly, claim 29 was rejected over *Menon*, *Aggarwal*, *Mojsilovic* and *Gravila* in further view of *Hu*. Similarly, Claim 30 was rejected under over *Menon*, *Aggarwal*, *Mojsilovic* and *Gravila* in further view of *Perona*.

However, as discussed above with respect to the rejection of claim 23, the *Menon, Aggarwal, Mojsilovic, Gravila* combination fails to teach or describe at least one of the elements of the Applicants claimed invention. Consequently, in view of the discussion provided above in Section 2.8, it is clear that modifying the *Menon, Aggarwal, Mojsilovic, Gravila* combination in an attempt to address particular features of dependent claims 26-27, 29, and 30 cannot serve to disclose the Applicants claimed invention where the *Menon, Aggarwal, Mojsilovic, Gravila* combination reference relied on by the Office Action fails to disclose the parent claim.

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 23, as cited above. Therefore, the Applicants respectfully traverse the rejection of claims 26-27, 29, and 30, and request reconsideration of the rejection of claims 26-27, claim 29, and claim 30 under 35 U.S.C. §103(a) over the *Menon, Aggarwal, Mojsilovic, Gravila, Etoh* combination, the *Menon, Aggarwal, Mojsilovic, Gravila, Hu* combination, and the *Menon, Aggarwal, Mojsilovic, Gravila, Perona* combination, respectively, in view of the non-obviousness of claim 23, as cited above.

2.10 Rejection of Claim 35 and Claim 38:

The Office Action rejected claim 35 under 35 U.S.C. §103(a) as being unpatentable over *Menon, Aggarwal, Mojsilovic* and *Etoh*, in further view of *Walpole*, based in part on the rationale used for the rejection of claim 32, as discussed above in Section 2.4. Similarly, claim 38 was rejected over *Menon, Aggarwal, Mojsilovic* and *Honey*.

However, as discussed above with respect to the rejection of claim 32, the *Menon*, *Aggarwal*, *Mojsilovic* combination fails to teach or describe at least one of the elements of the Applicants claimed invention. Consequently, in view of the discussion provided above in Section 2.4, it is clear that modifying the *Menon*, *Aggarwal*, *Mojsilovic*, *Gravila* combination in an attempt to address particular features of dependent claims 35 and 38 cannot serve to disclose the Applicants claimed invention where the *Menon*, *Aggarwal*, *Mojsilovic* combination reference relied on by the Office Action fails to disclose the parent claim.

Consequently, no prima facie case of obviousness has been established in accordance with M.P.E.P. Section 706.02(j) and in accordance with the holdings of *In Re Fine*. This lack of a prima facie showing of obviousness means that the rejected claims are patentable under 35 U.S.C. §103(a). The basis for this patentability is the nonobvious language of independent claim 32, as cited above. Therefore, the Applicants respectfully traverse the rejection of claims 35 and 38, and request reconsideration of the rejection of claim 35 and claim 38 under 35 U.S.C. §103(a) over the *Menon*, *Aggarwal*, *Mojsilovic Etoh*, *Walpole*, combination and the *Menon*, *Aggarwal*, *Mojsilovic*, *Honey* combination, respectively, in view of the non-obviousness of claim 32, as cited above.

CONCLUSION

In view of the above, it is respectfully submitted that claims 1-38, as amended, are in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of claims 1-38, and to pass this application to issue. Additionally, in an effort to further the prosecution of the subject application, the Applicant kindly invites the Examiner to telephone the Applicant's attorney at (805) 278-8855 if the Examiner has any questions or concerns.

Respectfully submitted,

Lyon & Harr
300 Esplanade Drive, Suite 800
Oxnard, California 93030
(805) 278-8855

Mark A. Watson
Registration No. 41,370
Attorney for Applicant